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The screenshot shows the PDF version of the article. At the top, it displays the journal's name 'AGRICULTURAL RESEARCH COMMUNICATION CENTRE' and website 'www.arccjournals.com'. The article title 'Relevance of draught cattle power and its future prospects in India : A review' is centered. Below the title, the authors' names 'Akila Natarajan*, Mahesh Chander¹ and N. Bharathy' and their affiliation 'University Training and Research Centre, (TANUVAS), Karur-639 001, Tamil Nadu, India.' are listed. The article ID 'R-1534' and DOI '10.18805/ar.v57i1.9264' are also present. The 'ABSTRACT' section begins with 'Domestic work animals exist in all regions of the world. In India, the energy for ploughing two-thirds of the cultivated area comes from animal power and they haul up to 15 per cent of the total freight in the available 14 million animal drawn carts. Thus the stock of 60 million working cattle and buffaloes were used for various agricultural operations, saving fossil fuel worth Rs 60 billion, annually. With nearly 83 million land holding (more than 75% of the land holding) being less than 2 ha in size, the animal power can play a very important role in Indian agriculture. But the cropping season in India generally lasts for only 30 days during kharif and 30 days in during rabi or a total of 60 days in a year. At least 200 days of work was necessary to get the breakeven point considering the cost of maintenance and market hire rate for draught animals. The annual use of Draught Animal Power should be expanded through haulage and electricity generation and the new research findings should be communicated to the farmers through training.' The 'Key words' section lists 'Animal power, Draught cattle, Small farmers.' The main text of the article follows, discussing the role of livestock in agriculture and the impact of mechanization. It mentions that in the cotton production area of Ghana, tractors were introduced in the 1960s and 1970s, but are falling into disuse and being replaced by animal power. It also notes that animal traction technology was introduced into Uganda in 1909, and that in Sub-Saharan Africa, the use of work animals for agriculture and rural transport is increasing every year. The article concludes by stating that animal power remains important in Spain, Portugal, and Greece, where farms are of small size, and in the United States, where Amish farmers run their farms profitably using only animal power. It also mentions that in highly developed European Union, animal power remains important in smallholder maize producers in central Kenya, and in countries like India, Mexico, Brazil, and South Africa that are rapidly urbanizing and

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Physiological Responses of Bullocks in Rotary Transmission System for Briquette Production

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ABSTRACT

Draught animals such as bullocks and he buffaloes are the important source of energy for agricultural operations on small and marginal farms of Chhattisgarh, which constitute three fourth (75.77 %) portion of total land holding. Draught animals used in this region are small sized. In this paper physiological response of non-descriptive breed of bullocks of Chhattisgarh region in rotary power transmission system for briquette production are described. The physiological responses of Bullock in terms of pulse rate, respiration rate and body temperature were recorded during the briquette production after every one hour workout. The average speed of bullock during briquette production and power output was recorded 0.84 m/s and 0.43 kW respectively. The power output reduced with passage of time. The operating speed of bullock varied with the working hour and the bullocks were not fatigue after 6 hours of work as they scored 16 points against the fatigue level score of 20 points.

Keywords: Rotary Transmission System, Biomass, Proximate Analysis, Briquettes, Physiological Response

Draught animals have been a major power source in Indian agriculture since centuries. Recent advances in mechanization and fuel run machines have reduced the area under draught animal cultivation system. Still a large number of marginal and small holdings are cultivated using draught animals. With the modernization of agriculture, the use of mechanical power in agriculture has increased but draught animal power (DAP) continues to be used on Indian farms due to small holdings and hill agriculture.

rotary mode of power to operate different agro processing machines (Srivastava, 2000). In this view the draught animal power could be used to operate low hp post harvest machines. The machines are chaff cutter, grain grinder, grain cleaner-cum-grader, briquetting machine water lifting and generation of electrical power for lightening and domestic use. An animal drawn reciprocating pump was developed that used two units of hand pumps and reported that the average speeds of draught animal were 0.7

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A study on bullock energy utilization through rotary mode power transmission system in operating potato peeler and slicer for chips making as value added product of potato.

PUBLISHED | 2013 in *International Journal of Agricultural Engineering*

S. K. Swain (Orissa University of Agriculture and Tec...), M. K. Ghosal (Orissa University of Agriculture and Tec...), A. K. Dash (Orissa University of Agriculture and Tec...)

ABSTRACT COMMENTS (0) REFERENCES (0) CITED BY (0) VIEW IN SOURCE ADD COLLECTION

Abstract

Use of bullocks for agricultural work is limited to tillage, sowing and transportation. The total annual use of bullocks in the state of Odisha is less than 300 hours even though the annual potential use is nearly 800 hours. To enhance the utilization of bullocks, there is a need of using bullock power operated stationary machines requiring about 1 hp (0.8 kW) power for doing various post harvest operations in rotary mode like paddy threshing, paddy winnowing, chaff cutting, sugarcane crushing, groundnut decorticators, oil expelling, pulse milling and dehussing etc. This would ultimately reduce the economic burden of maintaining bullocks. With this aim, a study was conducted during the year 2012 for operating a potato peeler and slicer with the help of the rotary gear complex, installed in the premises of College of Agricultural Engineering and Technology, QUIAT, Bhubaneswar, Odisha. The experiments were conducted continuously for 3 hours (8 am- 11 am) with the work rest cycle of 1 hour work + 20 minutes rest + 1 hour work +30 minutes rest + 1 hour work. The measurement of physiological responses like respiration rate, heart rate, body temperature etc. of the small sized non-descript breed of bullocks (pair body weight of 450 kg) of Odisha were done at half an hour interval and calculation of the corresponding fatigue scores to know their comfortable working without inflicting any health hazards. The mean draft requirement of the potato peeler and slicer was found to be 7.70 % and 6.40 %, respectively in terms of percentage of body weight of the small size bullocks which were within their draftability. The highest fatigue scores during the operation of peeler and slicer were 18 and 17, respectively which were below the threshold fatigue score of 20. The output of potato peeler and slicer in rotary mode was observed to be 160 kg/h and 73 kg/h, respectively as against their corresponding values 200 kg/h and 100 kg/h in electrically operated motor and only 7 kg/h in manual peeling and slicing with the help of a knife. The operation of potato peeler and slicer through rotary mode was not found to be economical as compared to when operated with electric motor. Nevertheless, it was a meaningful utilization of animal power during the idle period in farm operations and to compensate the maintenance cost of the bullocks.

Tillage Operations management Power transmission Engineering Threshing

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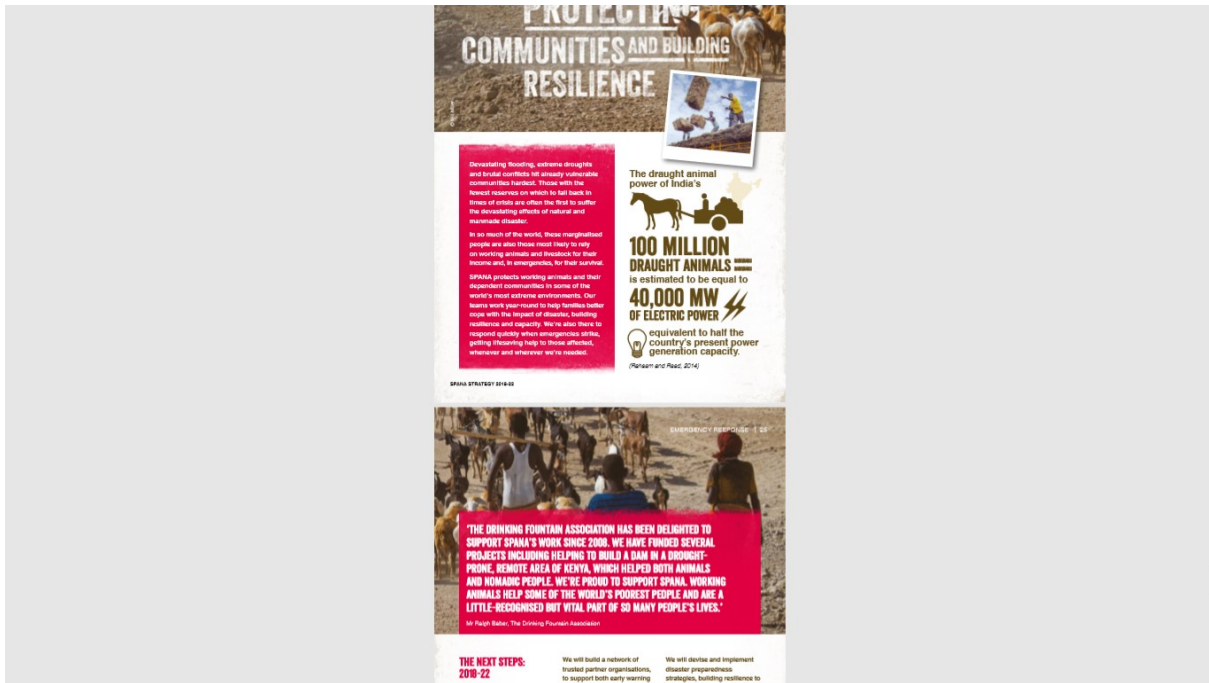
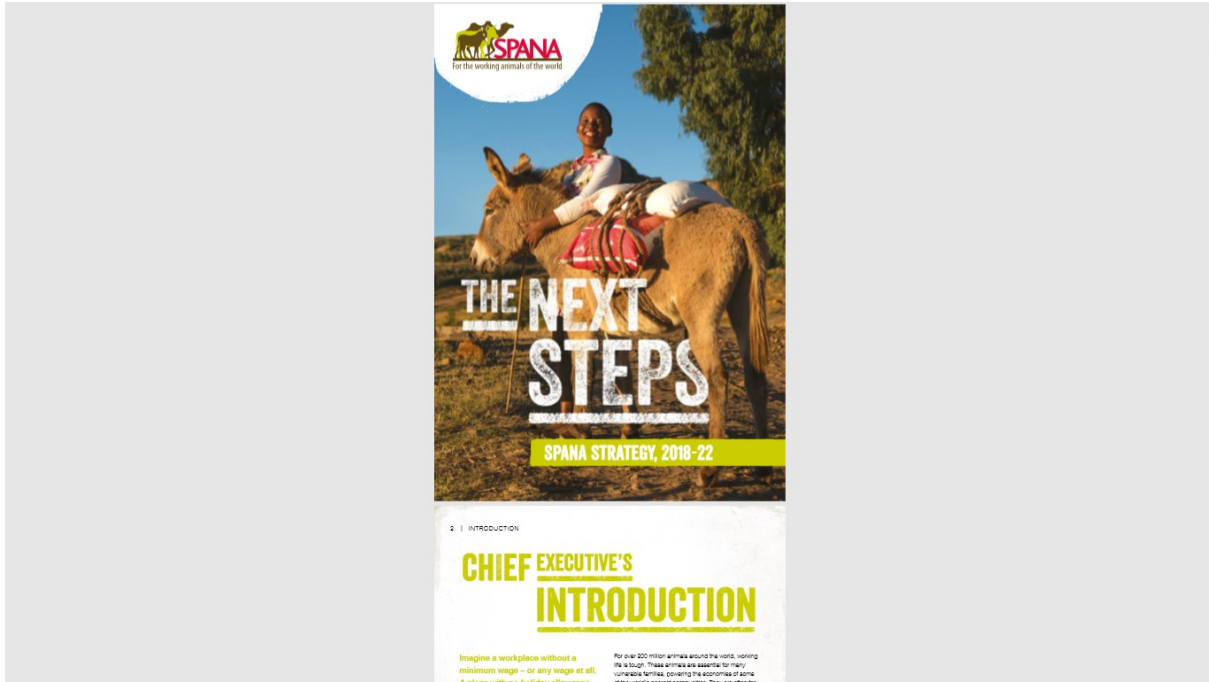
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Relevance of draught cattle power and its future prospects in India : A review.

- Source: Agricultural Reviews, Mar2016, Vol. 37 Issue 1, p49-54, 6p.
- Author(s): Natarajan, Akila; Chander, Mahesh; Bharathy, N.

• Abstract: Domestic work animals exist in all regions of the world. In India, the energy for ploughing two-thirds of the cultivated area comes from animal power and they haul up to 15 per cent of the total freight in the available 14 million animal drawn carts. Thus the stock of 60 million working cattle and buffaloes were used for various agricultural operations, saving fossil fuel worth Rs 60 billion, annually. With nearly 83 million land holding (more than 75% of the land holding) being less than 2 ha in size, the animal power can play a very important role in Indian agriculture. But the cropping season in India generally lasts for only 30 days during kharif and 30 days in during rabi or a total of 60 days in a year. Atleast 200 days of work was necessary to get the breakeven point considering the cost of maintenance and market hire rate for draught animals. The annual use of Draught Animal Power should be expanded through haulage and rotary mode of operation for agro processing and electricity generation and the new research findings should be communicated to the farmers through training.

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ELECTRICAL POWER USES FOR RURAL AREAS WITH ANIMAL POWERED DEVICE HYBRID WITH SOLAR ENERGY IN PLACE OF CONVENTIONAL FUEL

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ABSTRACT

In this paper a hybrid power system combining solar energy and animal energy is experimentally studied to supply continuous power for lightening in home and small uses of electrical power applications at rural area where wood and kerosene has been using and removal of its harmful effect on environment caused by the use of these fuels. Animals have been using for domestic works at rural areas but the electricity generation by Animal power is a new idea. The invented animal powered mechanical device has unique features of using animal power as prime mover for electricity generation. Animal energy in form of high-torque is converted into high-speed through mechanical system to energize the electrical energy generator. The electricity is stored in the battery and using inverter it can be use for lightening of home by converting Direct Current to Alternative Current. This equipment has long life, emission free and it is cost effective. The photovoltaic systems is used as primary source while the animal system is used as secondary source which can be used when needed. This system can work when the sun light is either available or not available in both conditions. This can replace the kerosene and other fuel uses for lighting and for small uses of electricity and can decrease the harmful effect on environment.

Keywords: Animal Power, Photovoltaic Systems, Kerosene Effect, Hybrid Energy.

I. INTRODUCTION

Lack of suitable home lighting is directly linked to illiteracy, poverty and health problems. Over 1.5 billion people rely on kerosene for light. The current widespread burning of kerosene also results in environmental pollution. It is very difficult and very costly to available grid power everywhere specially at remote isolated communities in developing countries. There are many renewable power sources like solar power, wind power, hydropower, bio-energy, geo-thermal power, tidal energy etc, but all have their limitations. Although from beginning of mankind animals have been using for domestic works at rural and remote areas, but the electricity generation by Animal power is a novel technology[1-4].